

1 REMARKS:

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3 Note: The Item Nos. below correspond to item nos. used in Examiner's Detail Action
4 dated 06/07/2007

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6 Item 1. References to "(H2)" and "(O2)" have been removed from the claims.

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8 Item 3. With regard to claim 1 and dependent claims 2, 5, 9, 11, 12 and 21, applicant
9 respectfully requests the Examiner to more carefully consider the following
10 claim 1 words and how the Houseman reference is clearly different:

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12 "first" (Claims 1, 11) – This claim word means that the applicant's invention has
13 two distinct "zones" of combustion: one is the combusting hydrogen and the
14 other is the combusting fuel. These two combustion zones have distinct
15 characteristics and combustion environments, the controlled interaction of
16 which is the nexus of the invention. The Houseman reference does not
17 distinguish separate combustion zones from the fuel and the recycle stream
18 because no differentiation exists. Both streams flow into and are ignited in a
19 common housing (see Fig. 6, item#18). The Examiner's comments do not
20 address this distinction.

21
22 "radially inwardly" (Claim 1) – In the Houseman reference, Figure 6, it can
23 clearly be seen that the air fuel mixture flowing into the helical tubes 70 exit into
24 the chamber 18 with opening pointing "radially outward." In column 5,
25 paragraph 3, lines 8 and 9, Houseman states the helical coils create a "strongly
26 outwardly rotating annulus of gas." In the applicant's invention, the
27 hydrogen/oxygen stream flowing into the tubes (See Fig. 1, item 21) is physically
28 directed "inward" so that the combusting hydrogen exiting each tube meets
29 at the center of the rotational axis. There is simply no figure or text in the
30 Houseman reference that teaches an "inward" direction for purposes of
31 interaction with other inwardly directed flames so that when the hydrogen
32 flames are rotated, they create a "near continuous zone of combusting
33 hydrogen" [paragraph 20, lines 6 and 7]. The Houseman device cannot create
34 a similar geometrical combustion shape with its design nor does it teach any
35 intention to do as applicant present in this invention. Examiner fails to cite any
36 such teaching nor does the Examiner's comments address this distinction.

37
38 "external" (Claim 1) – The Houseman reference calls for the gas flowing into the
39 helical coils coming from an "internal source." The applicant states the
40 hydrogen gas flowing through its non-helical coils as coming from an external
41 source. Applicant respectfully requests Examiner to reconsider the obvious and
42 significant differences between these two concepts.
43

1 "spaced from a fuel nozzle" (Claim 1) – In column 5, paragraph 3, line 2, the
2 fuel conduit 54 is identified as a "start-up nozzle." This means that the normal
3 operation of the device calls for fuel to flow into the helical coils as a vaporized
4 stream pre-mixed with exhaust gases. In the normal operation of applicant's
5 invention, a liquid fuel stream is sprayed directly into a pre-ignited stream of
6 combusting hydrogen without flowing through any pre-heating coils and
7 without being mixed with the hydrogen stream externally to the combustion
8 chamber. These are two completely different combustion concepts that are
9 described differently in the two specifications with different modes of operation
10 and different intended uses. Examiner fails explain how these clear difference
11 are insufficient to overcome anticipation under 35 USC 102(b).
12

13 "second" (Claim 1) – This word has significance relative the word "first." See the
14 argument presented above for the distinction created by this claim word.
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16
17 "mechanically rotating" (Claim 2) – The Examiner cannot sustain a reasonable
18 interpretation of the word "mechanically" without considering it together with
19 "rotating." There are no moving parts to the Houseman reference within the
20 context of the combustion assembly. One cannot reasonably say that a
21 stationary helical coil is equivalent to a plurality of rotating tubes. Especially in
22 light of the fact that, in this case, these two approaches produce dramatically
23 different results in relation to how the combustion environment is created and
24 controlled. The "mechanically rotating" limitation can only mean that a
25 physical movement of the flow conduit is specified. This concept is what the
26 applicant has presented in the specification. It is the effect of this mechanical
27 rotation that reduces the amount of external hydrogen generation necessary
28 to make the device functional. There is no equivalent structure or means
29 presented in the Houseman reference nor does the Examiner cite any basis for
30 finding such equivalency.
31

32 "conical surface" (Claim 21) – The claim is amended to refer the conical
33 surface to the "first" combustion zone. Although the "swirl" lines and "spray"
34 lines of the Houseman reference at Figure 6 show conical shapes, they do not
35 refer to a stable, separate combustion zone of hydrogen that is formed into a
36 conical structure by rotation of a plurality of hydrogen flames about a central
37 axis. Applicant respectfully requests Examiner to consider the physical concept
38 intended by claim 21 apart from the mere symbolic lines drawn in the
39 Houseman reference indicating general flow directions of the combustion
40 gases and hydrocarbon fuel from the start-up nozzle.
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7. Applicant respectfully objects to examiner's assertion as to the obviousness of "speed" and "range" relative to the Houseman reference. First, Houseman does not disclose any rotating parts to which "speed" and "range of speed" would be relevant. Houseman cannot be used as a reference for an "obviousness" rejection if it does not teach to do so or otherwise suggest that such a mechanical rotation would result in a useful outcome. Secondly, thousands of hours of experimentation and several prototype designs were necessary to produce a mechanically rotating set of hydrogen conduits that include speed controls. Even with speed controls affixed to the device, knowing what speed produces the most effective results with a given fuel required much experimentation (affidavits may be provided on request).

Claims 4 and 22 cited by Examiner as objected to in this Item No. do not relate to speed or range of rotation. Applicant is unclear as to the basis for an obviousness rejection and respectfully requests Examiner to clarify such basis for rejection as to these claims.

8. In the Claim Amendment dated 05/29/2007, claim 23 was cancelled.

9. Although Examiner indicates allowance of these claims, applicant respectfully request to delay conversion of these claims to independent form for allowance pending reconsideration of the arguments presented to the other claims.

Respectfully,



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